WHAT IS CLAIMED IS:

1.   Resolution filter (4) for a spectrum analyser (1),
      wherein the resolution filter (4) has the following
      complex, discrete impulse response $h_{used}(k)$:

$$h_{used}(k) = C_1 \cdot \left[e^{-C_2 T_a^2 \cdot k^2} * h_{allp}(t) \right] \cdot e^{-jC_3(k-k_0)^2 \cdot T_a^2}$$

      wherein C_1, C_2 and C_3 are constants, k is the
      sampling index and T_a is the sampling period,
      wherein $h_{allp}(t)$ is the Fourier retransform of $e^{j\varphi(f)}$,
      in which $\varphi(f)$ is a randomly-specified phase
      response dependent upon the frequency of the
      transmission function of the resolution filter,
      wherein k_0 is a free variation parameter and
      wherein the variation parameter k_0 is set in such a
      manner that the frequency overshoot determined by
      the group delay of the resolution filter (4) is
      compensated.

2.   Resolution filter according to claim 1,
      characterised in that
      the variation parameter k_0 is set in such a manner
      that the middle of the frequency response $H_{used}(f)$ of
      the resolution filter is disposed at the frequency
      origin at the frequency f=0.

3.   Resolution filter according to any one of claims 1
      or 2,
      characterised in that

$\varphi(f)$ and therefore also $h_{allp}(t)$ are selected in such a manner that a minimal-phase resolution filter is formed.

4. Resolution filter (4) according to any one of claims 1 to 3,
    characterised in that
    the value of the constant C_1 is:

$$C_1 = \sqrt{\frac{\pi}{2\ln(2)}} \cdot B_{res} \cdot T_a$$

wherein B_{res} is the bandwidth of the resolution filter (4).

5. Resolution filter (4) according to any one of claims 1 to 4,
    characterised in that
    the value of the constant C_2 is

$$C_2 = \frac{\pi^2}{2\ln(2)} \cdot \frac{1}{T_{res}^2},$$

wherein $T_{res} = 1/B_{res}$ is the reciprocal bandwidth B_{res} of the resolution filter (4).

6. Resolution filter (4) according to any one of claims 1 to 5,
    characterised in that
    the value of the constant C_3 is

$$C_3 = \frac{\pi}{K} \cdot B_{res}{}^2 ,$$

wherein B_{res} is the bandwidth of the resolution
filter (4) and K is the K-factor of the resolution
filter (4), wherein the K-factor is defined via the
equation:

$$f(t) = \frac{1}{K} \cdot B_{res}{}^2 \cdot t$$

and f(t) is a frequency variable with time t in a
linear manner, which is supplied to a mixer (3) of
the spectrum analyser (1) connected upstream of the
resolution filter (4).

7. Spectrum analyser for analysing the spectrum of an
input signal with a resolution filter (4)
specifying the frequency resolution, wherein the
resolution filter (4) has the following complex,
discrete impulse response $h_{used}(k)$:

$$h_{used}(k) = C_1 \cdot \left[e^{-C_2 T_a{}^2 \cdot k^2} * h_{allp}(t) \right] \cdot e^{-jC_3(k-k_0)^2 \cdot T_a{}^2}$$

wherein C_1, C_2 and C_3 are constants, k is the
sampling index and T_a is the sampling period,
wherein $h_{allp}(t)$ is the Fourier retransform of $e^{j\varphi(f)}$,
in which $\varphi(f)$ is a randomly-specified phase
response dependent upon the frequency of the
transmission function of the resolution filter,
wherein k_0 is a free variation parameter and

wherein the variation parameter k_0 is set in such a manner that the frequency overshoot determined by the group delay of the resolution filter (4) is compensated.

8.   Spectrum analyser according to claim 7,
characterised in that
the variation parameter k_0 is set in such a manner that the middle of the frequency response $H_{used}(f)$ of the resolution filter is disposed at the frequency origin at the frequency f=0.

9.   Spectrum analyser according to any one of claims 7 or 8,
characterised in that
$\varphi(f)$ and therefore also $h_{allp}(t)$ are selected in such a manner that a minimal-phase resolution filter is formed.